UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,431	01/28/2005	Hubert Sjoerd Blaauw	NL 020701	1272

24737 7590 04/13/2010
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
LANDRUM, EDWARD F	

ART UNIT	PAPER NUMBER
3724	

MAIL DATE	DELIVERY MODE
04/13/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/523,431
Filing Date: January 28, 2005
Appellant(s): BLAAUW ET AL.

Hubert Blaauw et al.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/17/2010 appealing from the Office action mailed 12/3/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,354,008	Domoto et al.	03-2002
JP60162766	Oiwa, Tsunemi	02-1984
5,953,969	Rosenhan. Folf G.	09-1999
6,662,614	Lim, Sang-Won	12-2003

5,857,260	Yamada et al.	01-1999
6,584,691	Gerasimov et al.	07-2003
4,259,126	Cole et al.	03-1981

Liang, Wang. "Low pressure plasma source ion nitriding compared with glow-discharge plasma nitriding of stainless steel" Surface and Coating Technology, (April 27, 2001), pp 31-37

Blawert et al. "Surface treatment of nitriding steel 34CrA1Ni7: a comparison between pulsed plasma nitriding and plasma immersion ion implantation" Surface and Coatings Technology, (1998), pp 1181-1186

Askeland, Donald R. "Rate of Diffusion (Fick's FIrst Law" The Science and Engineering of Materials, (1994), pp. 112 and 114

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 4-7, 10, 13, 14, 16, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Domoto et al, hereinafter Domoto, in view of Oiwa, in further view of Rosenhan, in witness of Applicant's Admitted Prior Art, hereinafter AAPA, and further in witness of Liang et al, hereinafter Liang, Blawert et al, hereinafter Blawert, Askeland, and Lim.

Domoto teaches (see Figures 1-3, 6, and 7) an electric shaver with a plurality of steel cutting elements coated on all sides of the blade with a nitride based film having a hardness of at least 1000 HV but possibly extending above 1500 HV. The nitride based film is applied to the cutting blade using a plasma CVD method. The cutting blades of

Domoto are capable of working in dry or additive type shavers as both are functional equivalents and would have no bearing to how the cutting blades were made as most electric dry shavers are made to still be cleaned by a cleaning solution or water.

Domoto teaches all of the elements of the current invention as stated above except the steel cutting element being a maraging or precipitation hardening steel, said steel being hardened simultaneously with a precipitation hardening process and with plasma nitriding which forms a top layer of super saturated nitrogen and a diffusion layer adjoining the top layer to the hardness of the steel, and the diffusion layer having an original hardness of the steel cutting blades at the center, preferably 200HV or at least 6 times less hard than the top surface layer, the hardness of the diffusion layer decreasing from the outer surfaces of the lamella.

Oiwa teaches (see included translated Constitution) that it is old and well known to apply a nitride layer to a steel electric shaver blade by means of plasma nitriding.

Rosenhan teaches (Col.1, lines 15-23) that while CVD processes for applying strengthening layers to a tool is an option, material deposited on the tool can tear or chip off when the material is used. Furthermore, Rosenhan teaches (Col. 2, lines 19-55) a maraging steel is a good steel for a plasma diffusion process and that a plasma diffusion process includes combining heating the material by precipitation hardening with plasma nitriding. Furthermore, the hardness of the diffusion layer changes continuously between the two outer layers (Col. 2, lines 34-37). This method creates a tool that wears about 10 times less than other known tools.

It would have been obvious to have modified Domoto to incorporate the teachings of Oiwa, Rosenhan, to use maraging steel for the cutting blades of the electric shaver and apply the nitride layer to the cutting blades of the electric shaver by means of a plasma nitride process combined with precipitation hardening. Maraging steel is a steel that can be easily nitrided and resists wear and crack propagation. Plasma nitriding and precipitation hardening the maraging steel cutting members would make the cutting blades of the electric shaver wear 10 times less than other known tools thereby prolonging the life of the cutting blades. AAPA teaches (Pg. 4, lines 26-28) the act of precipitation hardening the steel can occur prior to or while plasma nitriding the steel and therefore the timing of the two relative to each other lacks criticality. Therefore it would have been an obvious matter of design choice to a person of ordinary skill in the art to have the precipitation hardening occur simultaneously with plasma nitriding, since applicant has not disclosed that a specific timing of the two process relative to each other solves any stated problem or is for any particular purpose, because it has been shown that many methods are equally acceptable, and it appears the cutting element would perform equally well with any specific timing sequence between the precipitation hardening process and the plasma nitriding process.

Domoto does not explicitly state that the electric shaver is a dry shaver but it is inherent that the electric shaver of Domoto is a dry shaver as there is no mention of a lubricant or other liquid used with the shaver.

Regarding claims 1, 7, and 10, claiming the top layer being a uniform hardness, the diffusion layer decreasing in hardness, and the minimum hardness of the diffusion

layer being found at the center of the diffusion layer, each of these limitations is intrinsic in the process of plasma nitriding a precipitationally hardened steel. To support this, the examiner has provided four references that teach these facts. Liang et al (2001) teaches (Pg. 6, Col. 1, Paragraph 2) that plasma nitriding a surface makes that surface have a top layer consisting of supersaturated nitrogen. Blawert et al (1998) teaches (Pg. 2, Col. 1, lines 2-5) teaches that plasma nitriding a surface causes a top layer to be formed along with a diffusion layer between the top layer and the material being nitrided. Askeland (1994) teaches (see Figures 5 and 6, the A and B characters have been added by the examiner to the upper Figure because the reproduction was made in black and white) that a diffusion layer is a constantly changing layer formed between the two materials where the two materials exchange atoms. Each edge of the diffusion layer takes properties that abut the edge of the diffusion layer as more of that abutment materials atoms are found there compared to the other material found on the opposite edge of the diffusion layer. Therefore, the minimum hardness of the diffusion layer would be in the center of the two compounds abutting the diffusion layer if both were relatively the same hardness. The non uniform structure created by the combining of atoms of the different compounds would be at its greatest in the center because neither compound would have a large majority of atoms present. Figures 5 and 6 of Askeland clearly show this point. Lim further teaches (Col. 8, lines 6-8; Figure 8) the point taught in Askeland that a plasma nitrided layer has a hardness that ranges between the original hardness of the cutting tooth below the nitrided layer and the hardness of the coating layer above the nitrided layer.

Regarding claims 4, 13, and 25-27, and the diffusion layer either being 200HV at the center or the top surface layer being at least six times harder than the center of the diffusion layer, it would have been an obvious matter of design choice to a person of ordinary skill in the art to make the center of the diffusion layer 200HV or the hardness of the top surface layer at least 6 times harder than the center of the diffusion layer because discovering the optimum or workable hardness of the center of the diffusion layer would have been a mere design consideration based on the type of steel a manufacturer wanted to use. Such a modification would have involved only routine skill in the art to accommodate the steel type requirement. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges only involves routine skill in the art.

Claims 2, 3, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified device of Domoto in view of Yamada et al, hereinafter Yamada.

The modified device of Domoto teaches all of the elements of the current invention as stated above except the thickness of the top layer being in the range of 5 μm to 25 μm, and the thickness of the diffusion layer being in the range of 5 μm to 20 μm.

Yamada teaches that the optimal total thickness of hardness layers covering a blade is between 2 μm and 15 μm (Col. 1, lines 66-67; Col. 2, lines 1-5).

It would have been an obvious to have modified the modified device of Domoto to incorporate the teachings of Yamada to make the total thickness of the top layer and

the diffusion layer 2 μm to 15 μm to provide for the best cutting conditions for both the outer and inner cutting blades.

Furthermore, it would have been an obvious matter of design choice to a person of ordinary skill in the art to make the thickness of the top layer between 5 μm to 25 μm and the thickness of the diffusion layer between 5 μm to 20 μm because discovering the optimum or workable ranges for the thickness of the top layer and the diffusion layer would have been a mere design consideration based on the material properties of both the cutting blade and the nitride based top layer. Such a modification would have involved only routine skill in the art to accommodate the properties of the cutting blade and the nitride based top layer. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified device of Domoto, as applied to claims 1, 4-7, 10, 13, 14, 16, and 25-27 above, in view of Gerasimov et al, hereinafter Gerasimov.

The modified device of Domoto teaches all of the elements of the current invention as stated above except the electric shaver being an additive type shaver.

Gerasimov teaches (see Figure 39) providing a solid soap additive 116 to an electric shaver for the purpose of improving lubricity as well as condition a user's skin or beard.

It would have been obvious to have modified the device the modified device of Domoto to incorporate the teachings of Gerasimov to provide an additive on the shaver.

Doing so would improve lubricity of the shaver as well as condition a user's skin or beard during shaving.

Claims 17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified device and method of Domoto, as applied to claims 1, 4-7, 10, 13, 14, 16, and 25-27 above, in view of Cole et al, hereinafter Cole.

The modified device and method of Domoto teaches all of the elements of the current invention as stated above except the steel cutting element being austenitic steel

Cole teaches (see Col. 1) teaches that it is old and well known in the razor art to make cutting blades out of austenitic steel.

It would have been obvious to have modified the modified the modified device and method of Domoto to incorporate the teachings of Cole to use austenitic steel for the cutting blades of the electric shaver and apply the nitride layer to the cutting blades of the electric shaver by means of a plasma nitride process. The physical properties of austenitic steel resist wear and crack propagation, and therefore are ideal for cutting blades intended to be used frequently.

(10) Response to Argument

Examiner would like to note the phrase "in witness of" used in the preamble of the claim 1 rejection is equivalent to "as evidenced by" and are used to merely disclose known facts or properties.

Regarding Appellant's arguments to claim 1 and Rosenhan found on page 12, Figure 2 shows the hardness of the intermediate (diffusion) layer changes continuously between the hardness of the outer layer and the hardness of the core steel. Because of

the intrinsic properties of plasma nitriding discussed in the rejection of claim 1 and Askeland above, if the hardness of the core steel had been the same as the hardness of the plasma nitrided outer later the center of the diffusion would be the least hard part of the tool. Regarding Lim, and column 7, line 64 to column 8, line 8, the reference teaches the same information as Rosenhan, specifically the fact that the hardness of the diffusion layer will range from the hardness of the outer layer and the hardness of the metal used for the tooth. Rosenhan further teaches the use of a maraging steel as taught in claim 1. Since the properties, uses, and benefits of plasma nitriding are known. Selection of the specific type of maraging steel of known types of maraging steels (based on the hardness of the steel desired after hardening and plasma nitriding) to make a cutting blade known to be made out of steels prior to the invention, the selection of the maraging steel being on the basis of suitability of intended use, would be entirely obvious.

Regarding Appellant's arguments on page 13 and the term simultaneously, the Encarta English Online Dictionary lists a definition of combine to be: "**2.** *transitive verb* **do things simultaneously:** to undertake two or more activities at the same time • *She has successfully combined a career as an attorney and a state senator."* Based on this definition it is reasonable to state the Rosenhan combining hardening and nitriding to be the act of performing both simultaneously. Furthermore, as disclosed by Appellant in the specification (Pg. 4, lines 26-28) there is no criticality to whether hardening occurs before or during the plasma nitriding step. Since Appellant has not disclosed that a specific timing of the two process relative to each other solves any

stated problem or is for any particular purpose, because it has been shown that many methods are equally acceptable, and it appears the cutting element would perform equally well with any specific timing sequence between the precipitation hardening process and the plasma nitriding process it would have been an obvious matter of design choice to a person of ordinary skill in the art to have the precipitation hardening occur simultaneously with plasma nitriding.

Regarding Appellant's arguments on pages 14 and 15, the outcome of plasma nitriding a steel is intrinsic, not the act of hardening. However, bother hardening and plasma nitriding a maraging steel were known in the art. Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Regarding Appellant's arguments on pages 16 and 17, please see examiner's remarks above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/EDWARD F LANDRUM/
Examiner, Art Unit 3724
4/8/2010

Conferees:

/Boyer D. Ashley/

Supervisory Patent Examiner, Art Unit 3724

/Joseph J. Hail, III/

Supervisory Patent Examiner, Art Unit 3723

Thorne & Halajian, LLP
Applied Technology Center
111 West Main Street
Bay Shore, NY 11706